

AMENDMENTS TO THE CLAIMS

1. (Previously and Currently Amended) A process for introducing an asphalt into a [synthetic fuel process] coal fines stream, comprising the steps of:
 - [introducing into the synthetic fuel process an oil-in-water asphalt emulsion;]
 - passing [said asphalt emulsion] an oil-in-water asphalt emulsion to an atomizer;
 - adding to said atomizer a motivating gas to form an asphalt [aerosol] atomized spray;
 - agitating a coal fines feed stream; and
 - injecting said [aerosol] atomized spray into said agitated coal fines.
2. (Original) The process as claimed in Claim 1, wherein said asphalt emulsion comprises asphalt particles having an average diameter of about 5 microns or less.
3. (Original) The process as claimed in Claim 1, wherein said asphalt emulsion is anionic, cationic or non-ionic.
4. (Original) The process as claimed in Claim 3, wherein said emulsion is anionic.
5. (Original) The process as claimed in Claim 1, wherein said emulsion has a pH of about 7.0 or greater.
6. (Original) A process as claimed in Claim 1, wherein said [introducing step] process further comprises:
 - manufacturing said asphalt emulsion upstream of said atomizer as part of a continuous, integral process for introducing an asphalt into a synthetic fuel process.
7. (Currently Amended) The process as claimed in Claim 6, wherein said asphalt emulsion manufacturing [step] comprises the further steps of:
 - introducing into the process an asphalt;
 - creating a mixture of water and soap;
 - mixing in a mixer said asphalt and said water and soap mixture to create an asphalt-soapy water mixture by passing said asphalt and said water and soap mixture along a common directional vector into a high turbulence mixing zone; and
 - emulsifying said asphalt-soapy water mixture to create said asphalt emulsion.

8. (Original) A process as claimed in Claim 7, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.
9. (Original) A process as claimed in Claim 8, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.
10. (Original) The process as claimed in Claim 1, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.
11. (Original) A process as claimed in Claim 10, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.
12. (Original) The process as in Claim 1, wherein said gas is selected from the group consisting of air, carbon dioxide, nitrogen and mixtures thereof.
13. (Original) The process as in Claim 1, wherein the [aerosol of said] atomized spray has a particle size of about 100 microns to about 500 microns.
14. (Original) The process as in Claim 1, wherein said [aerosol] atomized spray is formed by mixing said asphalt emulsion and said motivating gas inside said atomizer.
15. (Original) The process as in Claim 1, wherein said atomizer injects said [aerosol] atomized spray as a flat spray.
16. (Original) The process as in Claim 1, wherein said agitating step comprises mechanically agitating said coal fines.
17. (Original) The process as in Claim 16, wherein mechanical agitating involves continuously folding said coal fines.
18. (Original) The process as in Claim 1, wherein said [aerosol] atomized spray is generally evenly distributed over said coal fines.
19. (Original) A process for spraying an asphalt emulsion onto coal in the manufacture of synthetic fuel, comprising the steps of:
 - introducing a motivating gas into an atomizer;
 - introducing an oil-in-water asphalt emulsion into said atomizer;

creating in said atomizer an atomized stream of emulsion and gas; and
spraying said atomized stream onto an agitated coal fines stream.

20. (Original) The process as in Claim 19, wherein said asphalt emulsion comprises asphalt particles having an average diameter of about 5 microns or less.

21. (Original) A process as claimed in Claim 19, wherein said emulsion is anionic, cationic or non-ionic.

22. (Original) A process as claimed in Claim 21, wherein said emulsion is anionic.

23. (Original) A process as claimed in Claim 19, wherein said emulsion has a pH of about 7.0 or greater.

24. (Previously Amended) A process as claimed in Claim 19, wherein said step of introducing the oil-in-water asphalt emulsion comprises:

manufacturing said asphalt emulsion upstream of said atomizer as part of
a continuous, integral process for introducing an asphalt into a synthetic fuel process.

25. (Previously Amended) The process as claimed in Claim 24, wherein said asphalt emulsion manufacturing step comprises the further steps of:

introducing into the process an asphalt;

creating a mixture of water and soap;

mixing in a mixer said asphalt and said water and soap mixture to create an asphalt-soapy water mixture by passing said asphalt and said water and soap mixture along a common directional vector into a high turbulence mixing zone; and

emulsifying said asphalt-soapy water mixture to create said asphalt emulsion.

26. (Original) The process as claimed in Claim 25, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.

27. (Original) A process as claimed in Claim 26, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.

28. (Original) A process as claimed in Claim 19, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.

29. (Original) A process as claimed in Claim 28, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.

30. (Original) The process as in Claim 19, wherein said gas is selected from the group consisting of air, carbon dioxide, nitrogen and mixtures thereof.

31. (Original) The process as in Claim 19, wherein the aerosol of said spray has a particle size of about 100 microns to about 500 microns.

32. (Original) The process as in Claim 19, wherein said atomizer injects said aerosol spray as a flat spray.

33. (Original) The process as in Claim 19, wherein said agitated coal fines are mechanically agitated.

34. (Original) The process as in Claim 33, wherein said mechanically agitated coal fines involves continuously folding said coal fines.

35. (Original) The process as in Claim 19, wherein said atomized stream is generally evenly distributed over said coal fines.

36. (Original) A process for spraying an asphalt emulsion onto coal in the manufacture of synthetic fuel, comprising the steps of:

- introducing into the process an asphalt binder;
- creating a mixture of water and soap;
- mixing said asphalt binder and said water and soap mixture to create an asphalt-soapy water mixture;
- passing said asphalt-soapy water mixture to an emulsifier;
- emulsifying said asphalt-soapy water mixture to create an oil-in-water asphalt emulsion;
- passing said asphalt emulsion to an atomizer;
- introducing a motivating gas stream into said atomizer;
- creating in said atomizer an atomized stream of emulsion and air; and
- spraying said atomized stream onto an agitated coal fines stream.

37.-50. (Previously Cancelled)

51. (Original) A process for spraying an asphalt emulsion onto coal in the manufacture of synthetic fuel, comprising the steps of:

- introducing into the process an asphalt binder;

- creating a mixture of water and soap;
- mixing said asphalt binder and said water and soap mixture to create an asphalt-soapy water mixture, wherein said water and soap mixture and said asphalt binder are introduced into a mixer along a common directional vector and said asphalt binder is progressively cooled in said mixer, prior to mixing with said water and soap mixture;
- passing said asphalt-soapy water mixture to an emulsifier;
- emulsifying said asphalt-soapy water mixture to create an oil-in-water asphalt emulsion;
- continuously passing said asphalt emulsion to an atomizer;
- introducing an air stream into said atomizer;
- creating in said atomizer an atomized stream of emulsion and air; and
- spraying said atomized stream onto an agitated coal fines stream.

52. (Original) A process for producing an asphalt emulsion for use in manufacturing synthetic fuel, comprising the steps of:

- introducing into the process an asphalt binder;
- creating a mixture of water and soap;
- mixing said asphalt binder and said water and soap mixture to create an asphalt-soapy water mixture, wherein said water and soap mixture and said asphalt binder are introduced into a mixer along a common directional vector whereupon said asphalt binder is progressively and indirectly cooled by said water and soap mixture prior to mixing with said water and soap mixture; and
- emulsifying said asphalt-soapy water mixture to create an oil-in-water asphalt emulsion capable of being continuously applied.

53. (Original) The process as claimed in Claim 52, wherein said progressive cooling comprises:

- introducing said water and soap mixture to said mixer through a first flow chamber;
- introducing said asphalt binder to said mixer through a second flow chamber;
- and
- passing at least a portion of said water and soap mixture into a third flow chamber, said second flow chamber being housed within said third flow chamber, wherein said water and soap mixture progressively cools said asphalt binder as said asphalt binder flows through said second flow chamber.

54. (Original) The process as claimed in Claim 53, comprising the additional steps of passing said cooled asphalt binder and said water and soap mixture to a mixing zone and mixing said asphalt binder and said water and soap mixture.

55. (Original) A process for continuously applying an oil-in-water asphalt emulsion in a synthetic fuel process comprising the steps of:

creating an aerosol spray including a motivating gas carbon dioxide, nitrogen or mixture thereof gas and an asphalt emulsion; and
continuously spraying said aerosol spray into a source of agitated coal fines.

56. (New) A process for introducing an asphalt into a coal fines stream, comprising the steps of:

providing a coal fines feed stream;

mixing an atomized asphalt binder with said coal fines feed stream.

57. (New) The process of claim 56, wherein said process is for the production of a synthetic fuel.

58. (New) The process of claim 56, wherein said atomized asphalt binder results from introducing, as separate feeds, an asphalt emulsion and a motivating gas into an atomizer.

59. (New) A process for spraying an asphalt emulsion onto coal in the manufacture of synthetic fuel, comprising the steps of:

providing an asphalt binder;

providing a mixture of water and soap;

mixing said asphalt binder and said water and soap mixture to create an asphalt-soapy water mixture, wherein said water and soap mixture and said asphalt binder are introduced into a mixer along a common directional vector and said asphalt binder is progressively cooled in said mixer, prior to mixing with said water and soap mixture;

passing said asphalt-soapy water mixture to an emulsifier to create an oil-in-water asphalt emulsion;

continuously passing said asphalt emulsion to an atomizer;

introducing an air stream into said atomizer;

creating in said atomizer an atomized stream of emulsion and air; and
spraying said atomized stream onto an agitated coal fines stream.